PLEASE POST

EOL SEMINAR *EOL*

The Global Distribution of Atmospheric Oxygen

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Measurements of atmospheric oxygen (O_2) provide unique insights into global scale physical and biological ocean processes. During the HIAPER Pole-to-Pole Observations (HIPPO) campaign, which flew on the NSF/NCAR Gulfstream V research aircraft from 2009-2011, we measured the vertical, latitudinal, and seasonal distribution of atmospheric O_2 with unprecedented precision and coverage. Subsequently, since 2012 we have been conducting continuous measurements of atmospheric O_2 from the NSF ship ARSV Laurence M. Gould, operating in all seasons between Chile and the Antarctic Peninsula, and resolving the seasonal and latitudinal O_2 variations over the Southern Ocean with even greater clarity. These recent *in situ* measurement programs leverage a multi-decade global network of flask sampling stations, with O_2 measurements conducted by colleagues at Scripps Institution of Oceanography and other institutions. I will discuss the challenges in making these measurements and will present some of the insights we are gaining from them, including novel constraints on the thermal and physical forcing of Southern Ocean seasonal carbon exchange and an improved quantification of global north-south ocean heat transport. I will also confirm or reject the existence of a large Equatorial Pacific bulge in atmospheric O_2 concentration, long suspected from a subset of global ocean biogeochemistry models but never well documented.

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